United States Patent [19]

Ungerer

[11] **3,819,464**

[45] **June 25, 1974**

[54] **WEATHER STRIP AND METHOD OF MAKING**

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[73] Assignee: **The Standard Products Co.,** Cleveland, Ohio

[22] Filed: **Jan. 2, 1973**

[21] Appl. No.: **320,297**

Related U.S. Application Data

[63] Continuation of Ser. No. 89,582, Nov. 16, 1970, abandoned.

[52] **U.S. Cl.** **161/64,** 49/489, 161/119, 161/123, 161/134

[51] **Int. Cl.** **B32b 3/00,** E06b 7/22

[58] **Field of Search** 49/489, 490, 491; 161/62–67, 119, 123, 134

[56] **References Cited**

UNITED STATES PATENTS

3,616,135 10/1971 Tesainer 161/67

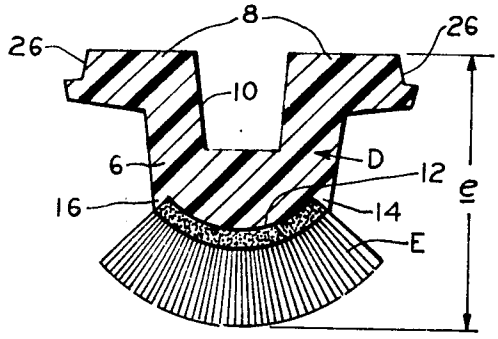
Primary Examiner—William J. Van Balen

Attorney, Agent, or Firm—Meyer, Tilberry & Body

[57] **ABSTRACT**

A flocked weather strip for insertion into a T-shaped recess of a door or door frame for engagement with the other upon closing. The weather strip is comprised of a T-shaped member of plastic with flocking adhered to the end of the upright. The end of the upright is so shaped that the adhesive used does not flow onto the sides of the upright.

10 Claims, 11 Drawing Figures



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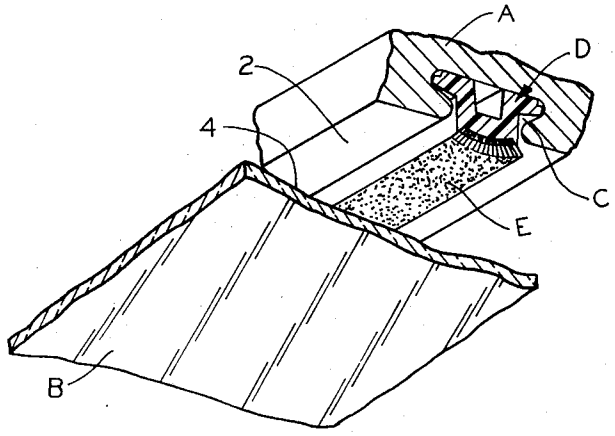

Fig. 1.

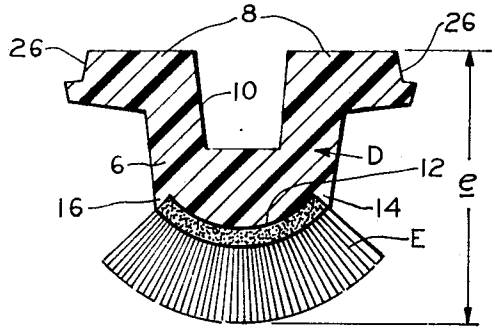

Fig. 2.

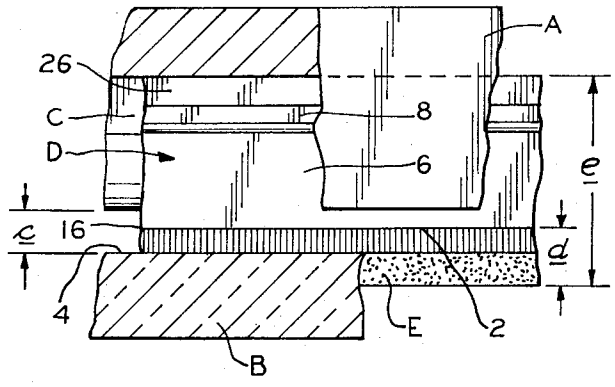

Fig. 3.

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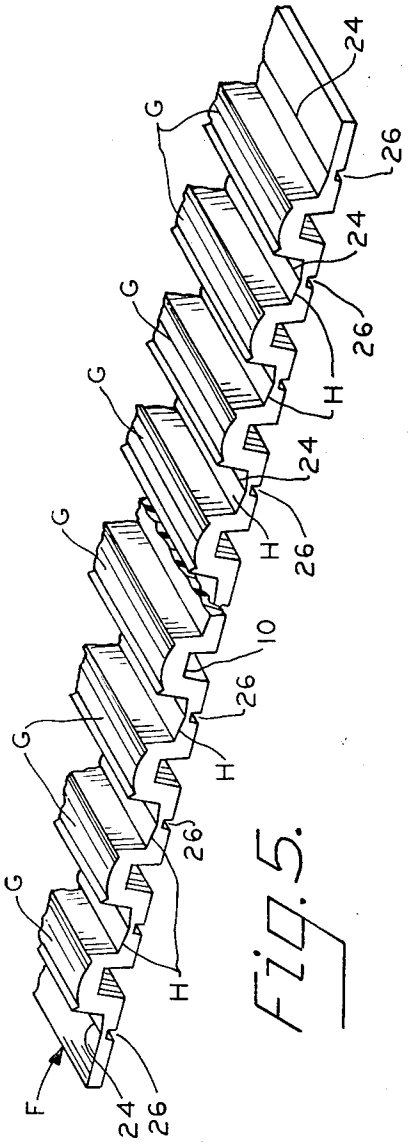

Fig. 5.

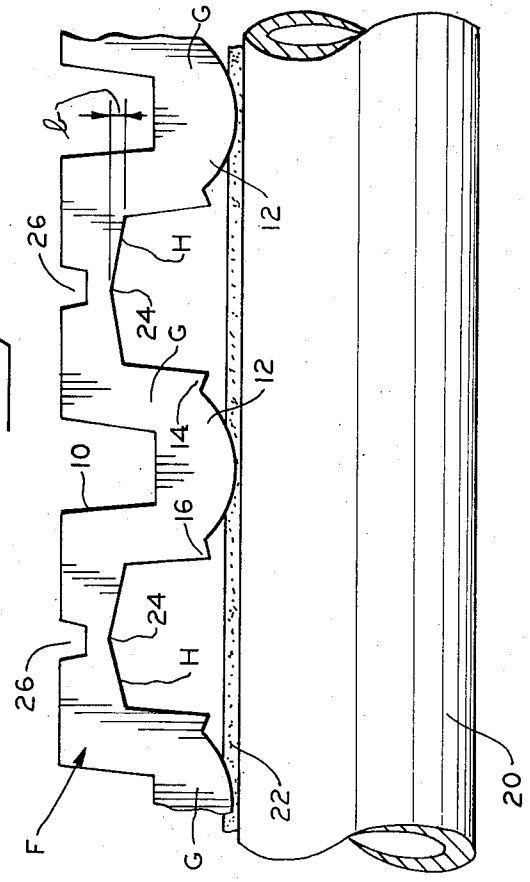

Fig. 6.

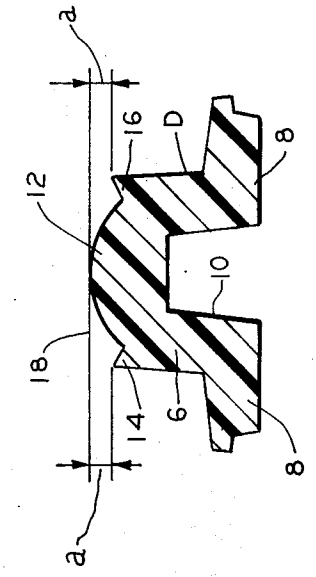

Fig. 4.

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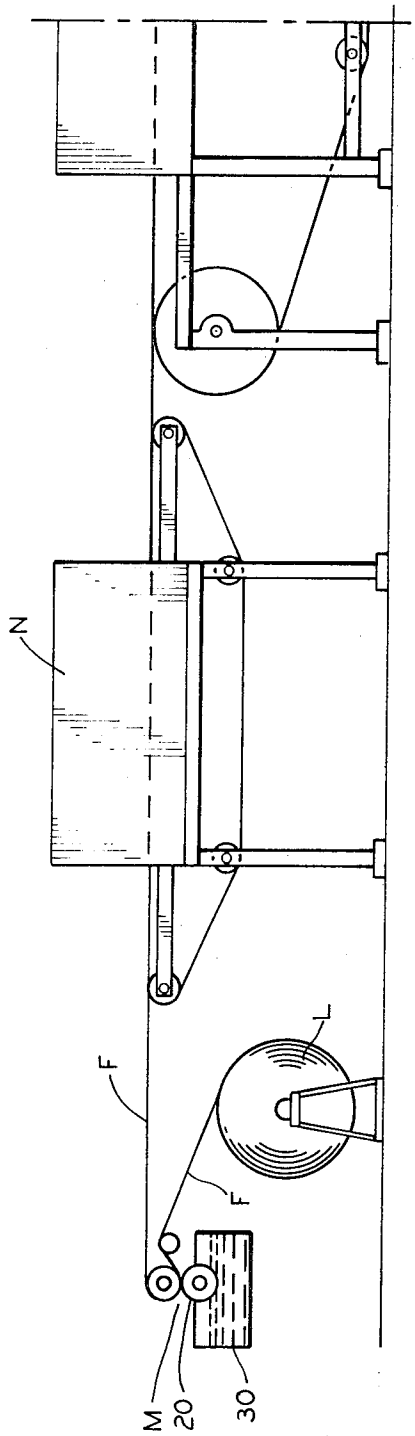

Fig. 8a.

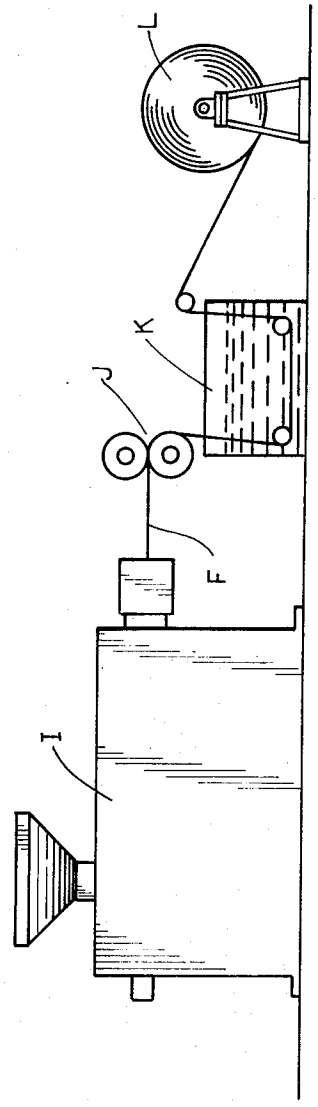

Fig. 7.

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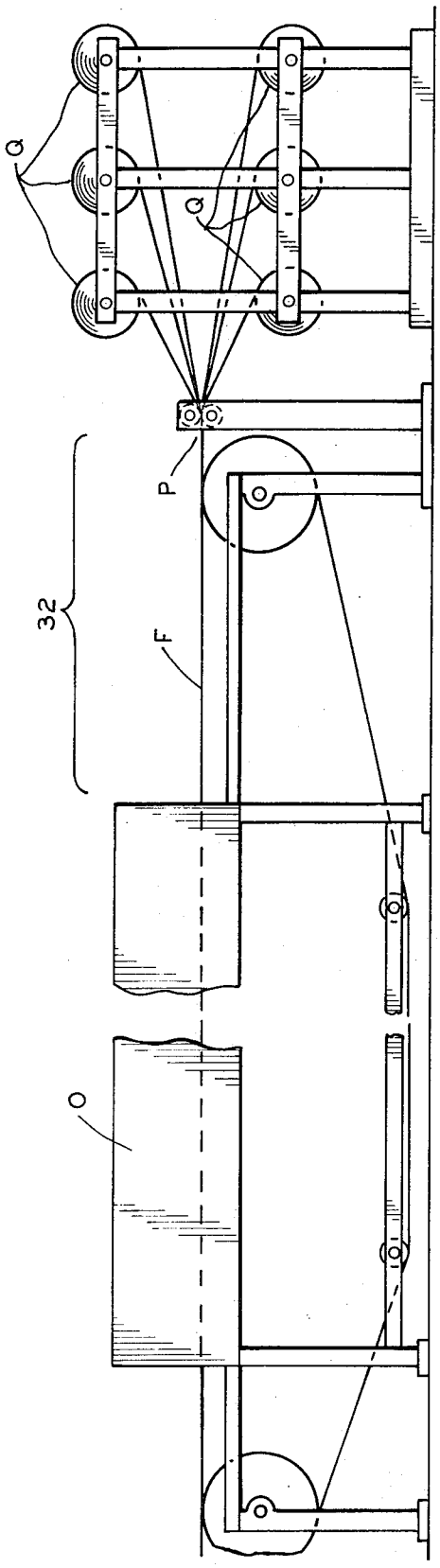

Fig. 8b.

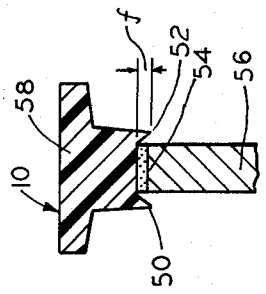

Fig. 10.

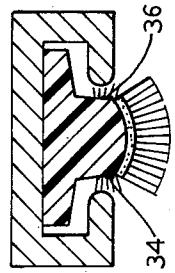

Fig. 9.

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WEATHER STRIP AND METHOD OF MAKING

This is a continuation, of application Ser. No. 89,582 filed Nov. 16, 1970 now abandoned.

RELATED APPLICATIONS

An application related to this one is Ser. No. 89,657 filed Nov. 16, 1970 now U.S. Pat. No. 3,690,038 further disclosing a feature briefly disclosed herein, and claiming the feature which consists of a T-shaped weather strip in which the crossbar of the T is provided with a continuous cavity substantially midway of the edges of the strip. The related application covers an invention of Melvin L. Dieterich and is assigned to the assignee of this invention.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention pertains to weathersealed closures, and more specifically to closures of the type in which two closure members are movable relative to each other, usually but not necessarily in a sliding direction, in which the weathersealing material is a dense flock carried by a body occupying a recess in the surface of one of the closure members and the flock is in sealing engagement with the surface of the other closure member. Such closure members are commonly found in automobiles in the form of sliding windows, and in housing, especially in the form of large sliding class doors.

2. Description of the Prior Art

A typical prior art weather strip consists of a flat strip of material carrying a dense stand of flock fibers midway of the strip and substantially perpendicular thereto so that the assembled strip, in a transverse cross section, resembles a shoe brush having a flat or thin body and long bristles. The flat body is adapted to occupy the crossbar space of the T in a T-shaped recess in one element of a closure which comprises two closely spaced relatively movable elements. The upright of the recess T is a slot in the surface of the recessed member. The flock fibers of the weather strip extend out through the recess slot into an "interference" engagement with the adjacent surface of the other closure element.

Flock fibers are expensive, costing approximately $2.00 per pound, so it is desirable to make the fibers as short as possible consistent with achieving a satisfactory seal against undesirable air infiltration. Indeed, the long fibers themselves contribute to air infiltration in cases where the flock extends through the entire depth of the slot forming the upright of the T-shaped recess. Moreover, since the fibers often contact a glass surface and provide a cushion against glass breakage, fibers which are too long as well as fibers which are too short provide insufficient cushion against shock impact. It has been suggested to make the base strip of a formed sheet of polyethylene terephthalate plastic (Mylar) with a raised mid-portion carrying the flock to enable the use of a shorter flock. See especially FIG. 5 of U.S. Pat. No. 3,266,190, issued Aug. 16, 1966 and assigned to the assignee of this invention. However, polyethylene terephthalate is a very expensive material, and every effort needs to be made to bring building costs down. Moreover, in a wide weather strip, polyethylene terephthalate is so flexible as to have two additional drawbacks, namely the mid-portion of the base yields so that the flock moves away from the engaged cooperating surface so as to impair the effectiveness of the seal; and the usual relative sliding movement between closure elements applies a force to the weather strip that is transverse to the strip length, and a wide strip that is too flexible may be dragged out of the recess. The result is that polyethylene terephthalate, even if inexpensive, would still have too many disadvantages for a satisfactory weather strip that can compete in the market place with others.

SUMMARY OF THE INVENTION

The present invention contemplates a weather strip for T-shaped recesses which is less expensive than prior art weather strips, but at the same time provides a better seal than conventional strips. In accordance with the invention, a weather strip is provided comprised of a body which in transverse section resembles a T of which the crossbar is adapted to occupy the long space of the recess which forms the crossbar of the recess T, while the upright of the T of the body extends into the slot forming the upright of the T of the recess. The body is formed of a plastic resin which is extrudable from a mass to a nonuniform cross section, such as a vinyl resin, which bears a high percentage of an inexpensive filler to give the product stiffness while cutting the cost appreciably. As an example of comparative costs, it may be pointed out that a "filled" vinyl costs approximately 7 cents per pound, as opposted to $2.00 per pound for flock fibers. A dense stand of flock fibers is adhesively secured to the free end of the upright of the T of the body which, in the preferred embodiment, is specially formed to prevent adhesive flow over the side of the upright.

In the method aspects of the invention, a vinyl plastic with a calcium carbonate filler is extruded in sheet form and is then embossed to form alternating parallel ridges and grooves. Between adjacent ridges, each groove is formed to facilitate tearing along predetermined lines. Each ridge is crowned and is formed with a dam along each edge of the crown. The dams terminate short of the crowns so as not to contact the film of plastisol adhesive applied to the crowns by an applicator roll, after which the flock is applied and the adhesive is heat cured in a suitable conventional oven. After cooling, the sheet is torn between the ridges into separate strips which are wound onto individual reels.

It is accordingly an object of this invention to provide a weather strip having a T-shaped body of an inexpensive extrudable resin carrying a high percentage of an inexpensive filler having flocked material adhered to the end of the upright of the T.

It is another object of the invention to provide a T-shaped weather strip having a dense fiber flock on the free end of the upright of the T, the flock being secured by an adhesive to the body of the strip which is formed to prevent flow of adhesive off the end.

Still another object of the invention is an intermediate product comprising a plastic sheet having alternating ridges and grooves that may be readily provided with a sealing material on the ridges and is formed to be torn easily and uniformly between the ridges into separate strips.

A further object of the invention is to provide a process for a more economical manufacture of a better and more uniform closure assembly, and better and more uniform flocked weather strips, and sheets that can be further processed into weather strips.

THE DRAWINGS

The invention may take physical form in certain parts and arrangements of parts, a preferred embodiment of which will be described in detail in this specification and illustrated in the accompanying drawings which form a part hereof and wherein:

FIG. 1 is a view in perspective, with parts broken away and in section, of a closure assembly made according to a preferred embodiment of this invention.

FIG. 2 is an enlarged cross sectional view of a single, separated plastic weather strip.

FIG. 3 is a side view of a pair of cooperating closure elements provided with a weather strip according to this invention, with parts broken away to illustrate the interference type of engagement between the flock fibers and the panel engaged thereby.

FIG. 4 is a view similar to FIG. 2 but without the clock to show the configuration of the surface to which the fibers are secured, and with the body in the same orientation as it occupies during the clocking and heat curing steps of the manufacturing process.

FIG. 5 is a view in perspective of an intermediate aspect of the invention, the intermediate product shown in FIG. 5 being the formed plastic sheet prior to application of the adhesive and the flock.

FIG. 6 is an enlarged cross sectional view showing a portion of the intermediate product illustrated in FIG. 5 as the adhesive is applied to the crowned surfaces of the ridges.

FIG. 7 shows one aspect of the method portion of the invention, namely the extrusion and forming process of the intermediate product shown in FIG. 5.

FIGS. 8*a* and 8*b* together illustrate another aspect of the method part of this invention, FIG. 8a illustrating the steps of applying the adhesive to the intermediate product shown in FIG. 5 and passing the plastic sheet through a flock machine, and FIG. 8*b*, a continuation of FIG. 8a, illustrating the steps of heat-curing the adhesive to firmly adhere the flock to the crowned surfaces, separating the plastic sheet thus flocked into separate strips, and winding the separate weather strips onto individual reels.

FIG. 9 is a cross sectional view through a closure assembly made without the dams to control adhesive flow to show the the advantages of the dams.

FIG. 10 is a cross sectional view through a weather strip showing adhesive being applied and illustrating another embodiment of the invention.

Referring now to the drawings in detail wherein the showings are for the purposes of illustrating the preferred embodiment of the invention only and not for the purposes of limiting the same, FIGS. 1, 2 and 3 show a closure having two closure elements A and B which are relatively movable, usually having a sliding motion one with respect to the other, and in one of the closure elements, here shown as the element A, there is a T-shaped recess C in which a T-shaped weather strip D is disposed. Weather strip D carries a weather sealing material E which has a sealing contact with the closure element B.

A preferred embodiment of the method of making weather strips according to this invention involves the production of a sheet F (FIG. 5) which comprises a sheet of plastic such as vinyl and made in the form of a plurality of alternating ridges G and grooves H. FIG. 7 illustrates a preferred method of producing sheet F, which method includes a sheet extrusion process which takes place in an extruder I, an embossing process taking place in an embossing station J and whereby the sheet is embossed to the configuration depicted in FIG. 5, and if the resulting sheet F is not immediately formed into completed weather strips, a cooling step is accomplished in a cooling tank K and the cooled sheet shown in FIG. 5 is stored on a reel L. Additional aspects of the method invention are illustrated in FIGS. 8a and 8b wherein, in a series of steps, the plastic sheet F is appropriately coated with adhesive at station M, passed through a flock machine N and then an adhesive curing oven O, after which the sheet passes through a separator P, and the separated weather strips are wound on individual reels indicated at Q.

Referring again to FIGS. 1, 2 and 3, the weather strip as such is shown at D and comprises an elongated strip of plastic having a generally T-shaped cross section, with the free end of the upright of the T carrying a weather sealing material indicated as flocking E. The weather strip itself occupies the T-shaped recess C in the element A of the two closure elements A and B, and the flock sealing material E is in sealing contact with closure element B. The recess C is in the face 2 of element A, face 2 being the underside of the element A as seen in FIGS. 1 and 3, and the flock E engages the upper face or surface 4 of the closure element B, surfaces 2 and 4 being the cooperating surfaces for the purposes of effecting the desired weather seal. As is best seen in detail in FIGS. 2 and 4, the weather strip D, in cross section, resembles a T having an upright 6 and a crossbar 8. In the invention herein claimed, crossbar 8 may be a solid or continuous member. The cavity shown at 10 forms no part of the invention in this case, but is disclosed in greater detail and is claimed in the Dieterich application identified above.

The free end of the upright 6 of the T is crowned or provided with a crowned surface as shown at 12. The edges of the crowned surface 12 are provided with dams 14 and 16 and, as is apparent from FIG. 4, the peaks of dams 14 and 16 are spaced from a plane shown at 18 which is tangent to the crowned surface 12 and parallel to the crossbar 8. The distance *a* between the plane 18 and the peaks of the dams 14 and 16 is a function of the viscosity of the adhesive which is applied to the crowned surface 12 and which secures the flock to the free end of the upright of the T. The dimension *a* should be such that the adhesive does not run off the upper surface of the crowned surface 12 and down along the sides of upright 6 of the T. Application of the adhesive along the sides produces undesirable results and it is an object of this invention to avoid such distribution of adhesive. The spacing of the peaks of dams 14 and 16 from the plane 18 also serves to keep those peaks out of contact with the applicator roll which applies adhesive to the crowned surface 12. The viscosity of the adhesive will ordinarily be such that the applicator roll will not come into actual contact with the crowned surface 12, but will be spaced therefrom by a layer of adhesive which remains on the applicator roll as it turns. Moreover, the film of adhesive on the applicator roll should not come into contact with the peaks of the dams 14 and 16.

FIG. 5, as mentioned hereinbefore, shows the cross-sectional configuration of plastic sheet F, which may be considered as an intermediate product of the invention. FIG. 6 shows the plastic sheet F in the orientation it as-

sumes at station M in FIG. 8a, wherein the adhesive applicator roll **20** is beneath the plastic sheet F, and a layer **22** of plastisol adhesive is carried around on the applicator roll **20** into contact with the crowned surfaces **12** on the free ends of the uprights of the several T shapes of the plastic strips which, taken together as seen in FIGS. **5** and **6,** form the ridges G and the grooves H.

The "bottom" of each groove H is formed with a taper, as will be apparent from the dimension shown as *b* in FIG. **6**; the invention has been practiced successfully with dimension *b* equal to approximately 0.005 inch. It will of course be apparent that the orientation of the plastic strip shown in FIG. **5** makes it proper to refer to the "bottom" of the groove H whereas the orientation shown in FIG. **6,** is so to speak, upside-down relative to the orientation shown in FIG. **5.** Accordingly, the taper of the grooves H is, in FIG. **6,** at the "top" of each groove. In both figures, the groove tapers from each ridge toward a line **24** which is midway between ridges G. The taper thus illustrated would of itself result in a minimum thickness of the "bottom" of the groove as seen in FIG. **5.** Such minimum thickness of the groove at the line **24** would facilitate separation by tearing of the plastic strip at the line in each case between the adjacent ridges G. However, in order to further facilitate such tearing at a controlled location, the opposite surface of the plastic sheet F is creased or recessed as shown at **26,** and it will further be observed that the creases or recesses **26** are precisely aligned with the lines of minimum thickness **24.**

It is expedient at this point to comment on the advantages of the lines of minimum thickness **24** and the aligned creases **26.** It would of course be possible to provide a sheet F without the lines of minimum thickness and also without the cooperating and aligned creases. The same severing function provided by the lines and creases could be accomplished by appropriate slitting knives suitably mounted. For a high degree of quality and uniformity in the resulting plastic strips, however, the registry of the slitting knives would have to be very precise in relation to other features of the plastic sheet F. It is much less expensive and much more efficient and effective to provide the lines of minimum thickness and the creases in the plastic sheet F in the embossing process shown at station J of FIG. **7.** In this respect, the shape then given to the plastic sheet is accomplished all in one operation and misalignment or improper registry is readily avoided.

Regarding the overall height of the weather strip T, with or without the flock, the strip is desirably so dimensioned that the crowned surface **12** comes approximately flush with the surface **2** of the closure element A in which the recess is provided that carries the weather strip. The flock serves both as a cushion and as a weather seal. If crowned surface **12** were to reach the surface **4** of the other closure element B (FIG. **1**), the weather strip might provide a better seal but would provide little or no cushion. However, if surface **12** does not reach at least to surface **2,** a less effective weather seal may result because of air infiltration through the fibers of the flock. It is helpful at this point to refer to FIGS. **2** and **3** for a description of the "interference fit" of the flock fibers to seal the gap between closure members A and B. As is apparent in FIG. **3,** the space *c* between surfaces **2** and **4** is less than the free length *d* of the flock fibers E as they extend beyond surface **2** without interference with surface **4.** The interference dimension $d-c$ varies, but I have found it convenient to design weather strips on the assumption that the dimension $d-c$ is approximately 20 percent of the overall strip height *e*, i.e., from the top line of crossbar **8** to the extreme lower tips of the fibers E.

Reference will now be made in greater detail to the method aspect of the invention illustrated in FIG. **7,** wherein, as aforesaid, an extruder is indicated generally at I. The extrusion process by which the method aspects are practiced is entirely conventional so no detail need be set forth regarding the extrusion process or the extruder apparatus, except to point out that a preferred material for the sheet F and the resulting strips is a vinyl plastic containing a high percentage of filler such as calcium carbonate. Such a combination has the advantage of being inexpensive and providing an end product, namely weather strip, which has a substantial degree of stiffness, this quality being desirable in this end product.

Because calcium carbonate is much less expensive than vinyl, it is desirable to use as much of the filler as possible consistent with other requirements, one of which being that the body have enough tensile strength to enable pulling it through the recess C in closure element A. A force of 5 pounds is usually enough to overcome the sliding resistance of body D in recess C. However, the sizes of recess C and body D vary considerably, and I have considered a body D as likely to be satisfactory if it can withstand a pull of 25 pounds. Toward that end, the percentage of filler which I consider "high" within the meaning of high as used herein is in the range of 50 to 70 percent of filler, and the preferred embodiment utilizes 100 parts of vinyl resin to 175 parts of calcium carbonate (by weight).

Although it will of course be understood by those skilled in the art that the output of extruder I is actually a wide strip, the intermediate product of the extruder I and embossing apparatus J is herein referred to as a "sheet", indicated as F in FIGS. **5** and **6** and similarly marked in FIGS. **7,** 8*a* and 8*b*. The designation of the intermediate product F as a sheet is herein made in order to distinguish the product in that form from the separate and individual, much narrower, strips each of which takes the shape of a single T in cross section. Sheet material F comes from the extrusion apparatus I in relatively hot form and passes through the embossing station J comprised of suitably shaped rollers, after which the sheet passes through a cooling tank K where it is immersed in water or other suitable cooling fluid. After the cooling step, the sheet can if desired go directly to the adhesive-application station shown at M in FIG. 8*a*, but in the apparatus illustrated in FIG. **7,** the sheet F is shown as passing to a storage reel L upon which the sheet is wound for storage until it is ready for the flocking operation.

Referring now in further detail to FIGS. 8a and 8*b*, the same storage reel L is shown in position to unwind sheet material F so that the sheet material may pass through an adhesive application station indicated generally at M. At station M, the adhesive-applicator roll **20** referred to above is shown as dipping into a supply of adhesive in a tank **30.** A layer of adhesive **22** (FIG. **6**) is carried along on the surface of applicator roll **20** and is applied to the crowned surfaces **12** of the ridges in sheet F. The dams **14** and **16** on each ridge keep the adhesive from flowing over the end of the upright of the

T while the sheet passes to the flocking station shown at N in FIG. 8*a*. The flock machine there illustrated schematically forms no part of this invention, but may be any one of a number of devices capable of depositing flock fibers on the adhesive-bearing ridges G, or more expressly, on the crowned surfaces **12** of those ridges. An example of electrostatic flocking apparatus such as might be used at the station N shown in FIG. 8*a* is set forth in Pat. No. **3,269,356,** issued Aug. 30, 1966 to W. J. Friderici, and assigned to the assignee of this application.

The sheet bearing the flock fibers then passes to the oven O as seen in FIG. 8*b*. The plastisol adhesive which is on the crowned surfaces **12** to which the flock fibers are adhered is a heat-curable adhesive, and the adhesive is cured or hardened in the over O. Again, the apparatus shown at O is conventional and forms no part of this invention per se.

Leaving the oven O, the sheet F passes through a section **32** wherein it may be air cooled, and thence through a separation station indicated at P. In the separation station P, the sheet F is separated into individual weather strips, the separation being a tearing action which takes place at lines **24** of minimum thickness, such separation being aided and assured by the creases **26** in the opposite surfaces of the sheet F, as aforesaid. The thus-separated strips are individually wound on separate rolls at the station Q.

FIG. **9** shows a weather strip without the dams **14** and **16,** for the purpose of showing some of the advantages of the preferred embodiment of the invention. The flock fibers which are deposited on the free end of the upright of the T section are deposited and held by those portions of the upright to which adhesive has been applied in the adhesive-applicator station shown at M in FIG. 8*a*. Often, some of the adhesive will run beyond the free edges of the upright, whereby some of the flock fibers will adhere to the portions of the adhesive which have run down along the sides of this upright member, such as is illustrated at **34** and **36** in FIG. **9.** Inasmuch as the flock fibers which adhere to the sides **34** and **36** do not contact the cooperating surface to form an effective seal, those fibers are in effect wasted and, moreover, operate disadvantageously to interfere with adjacent walls of the T slot and there resist insertion of the weatherstrip into the T slot. Accordingly, the embodiment illustrated in FIG. **9** shows one of the advantages of weather strips made according to the preferred embodiment and provided with the dams **14** and **16** illustrated in FIGS. **1 – 6.**

It may be remarked that the surface on the free end of the upright **6** of the T may be flat or crowned, the crowned surface being one of the aspects of the preferred embodiment. A desirable characteristic in the shape taken by the fibers in the finished form is the flared shape, most readily apparent in FIG. **2,** and a crowned shape for the end surface of the body D more readily produces the desired flare and is therefore shown as the preferred embodiment.

Another embodiment of the invention herein disclosed and claimed is shown in FIG. **10,** wherein the tips of the dams **50** and **52** are farther from the crossbar of the T by the dimension shown at *f*, and the application of adhesive **54** is by means of a narrow applicator roll **56.** However, the FIG. **10** embodiment requires a very precise registry of the applicator roll relative to the plastic strip **58** and the surface between the dams **50** and **52.**

The invention has been described with reference to several embodiments. Obvious modifications and alterations will occur to others upon reading and understanding this specification. It is intended that all such modifications and alterations be included insofar as they come within the scope of the appended claims or the equivalence thereof.

What is claimed is:

1. In a weather strip mountable on one of a pair of relatively movable closure members for sealing the space therebetween and which weather strip includes an elongate one-piece plastic body portion having an outer surface which faces said space when said body portion is mounted on the one closure member and side surfaces which extend in the direction from said outer surface toward the one closure member, and where said outer surface is adapted to receive a flowable and curable adhesive and fiber flock and which flock is adhered to the outer surface upon curing of said adhesive and thus supported on said outer surface for sealing engagement with the other of the closure members, the improvement comprising: said one-piece body portion including adhesive retaining means projecting outwardly of said outer surface and extending longitudinally of said outer surface along laterally opposite sides thereof to retain said adhesive and fiber flock on said outer surface from flow onto said side surfaces of said body portion prior to curing of said adhesive.

2. The improvement according to claim **1,** wherein said outer surface is convex.

3. The improvement according to claim **2,** wherein a transverse line tangent to said convex outer surface and parallel to the outermost ends of said retaining means is spaced outwardly of said outermost ends.

4. The improvement according to claim **1,** wherein said body portion includes integral mounting flanges extending outwardly from the laterally opposite side surfaces of said body portion.

5. A weather strip for sealing the space between a pair of relatively movable closure members comprising, an elongated plastic body portion mounted on one of the closure members and having an outer surface facing said space when said body portion is mounted on the one closure member, adhesive on said outer face, fiber flock adhered to said surface by said adhesive for sealing engagement with the other of the closure members, adhesive retaining means projecting outwardly of said outer surface and extending longitudinally of said surface along laterally opposite sides thereof, and at least one additional weather strip of generally identical construction, the body portions of said weather strip and said additional weather strip being disposed side by side in generally parallel laterally spaced apart relationship, the body portions of each said weather strip and additional weather strip including a pair of mounting flanges each extending outwardly from one of the laterally opposite sides of the corresponding body portion, the ones of said flanges between said body portion being integrally united along a longitudinal line of severance laterally intermediate said body portions, said line of severance being defined at least in part by longitudinally extending recess means in said ones of said flanges.

6. The weather strip of claim **5,** wherein said ones of said flanges have corresponding first and second sur-

faces extending laterally from said body portions, said recess means opening into said ones of said flanges from said first surfaces, and said second surface of each of said ones of said flanges extending from the corresponding body portion at an incline toward said first surfaces, said second surfaces terminating along a longitudinal line of juncture cooperatively aligned laterally with said recess means for said recess means and line of juncture to define said line of severance.

7. An intermediate weather strip product comprising: at least two parallel weather strip elements laterally spaced apart and severably interconnected, each of said weather strip elements including an elongated plastic body portion having an outer surface and laterally opposite sides each extending from a corresponding side edge of said outer surface, adhesive on the outer surface, fiber flock adhered to said outer surface by said adhesive, and a pair of mounting flanges each extending outwardly from one of the laterally opposite sides of the body portion, the ones of said flanges between the body portions of said parallel weather strip elements being integrally united, and said ones of said flanges including means providing a line of severance laterally intermediate the body portions.

8. The intermediate product according to claim **7**, wherein the ones of said flanges have corresponding first and second surfaces extending laterally from the body portions of the parallel weather strip elements, and a longitudinally extending recess in corresponding ones of said first and second surfaces defining said line of severance.

9. The weather strip according to claim **7**, wherein said ones of said flanges have corresponding first and second surfaces extending laterally from said body portions, corresponding ones of said first and second surfaces of each of said ones of said flanges extending from the corresponding body portion at an incline toward the other of said first and second surfaces and terminating along a longitudinal line of juncture spaced from the other of said first and second surfaces to provide a longitudinal area of minimum thickness defining said line of severance.

10. The intermediate product according to claim **9**, and recess means opening into said ones of said flanges from the others of said first and second surfaces, said recess means being aligned with said longitudinal line of juncture for said recess means and line of juncture to define said line of severance.

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